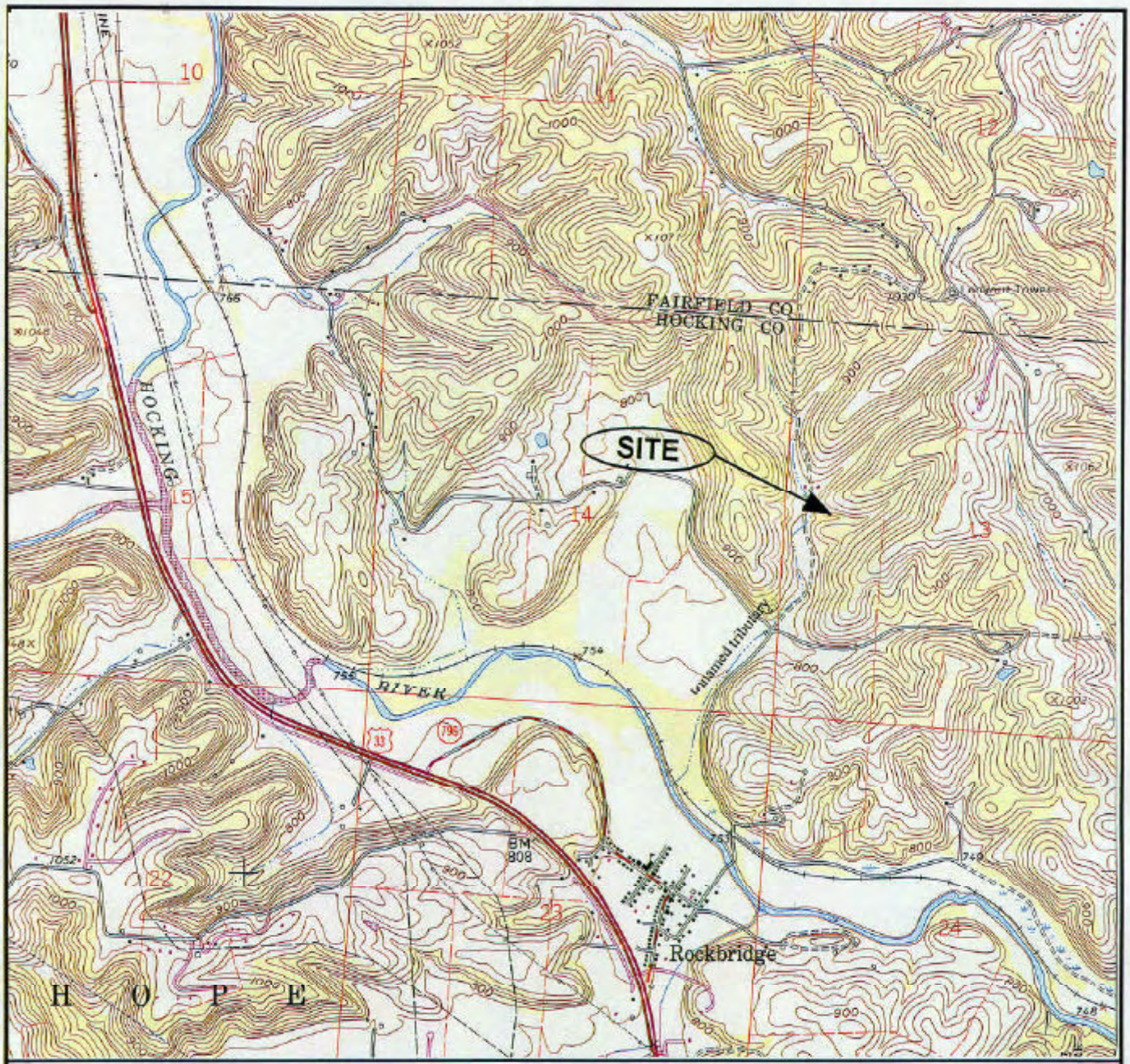
TROXEL TANK FARM
CHARACTERIZATION REPORT

Hocking County, Ohio

16 February 1999

Prepared for Columbia Gas Transmission Corporation

By:
Fluor Daniel GTI, Inc.
Environmental Standards, Inc.



SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE
ROCKBRIDGE, OHIO
7.5 MINUTE SERIES
DMA 4463 II SE – SERIES V852
1992

SCALE 1:24,000

0 2,000 4,000
SCALE FEET

N

QUAD LOCATION

FLUOR DANIEL GTI
6573 T COCHRAN ROAD
CLEVELAND, OHIO 44139
(216) 349–0004

DESIGNED: RJP	SITE LOCATION MAP		
DETAILED: RJP	CLIENT: COLUMBIA GAS TRANSMISSION CORPORATION		DRAWING DATE: 2/24/97
CHECKED:	LOCATION: TROXEL TANK FARM HOCKING COUNTY, OHIO		FIGURE: 1–1

2.0 ENVIRONMENTAL SETTING

2.1 Physical Setting

The Troxel Tank Farm property consists of approximately 100 acres. The operating portion of the facility (tank farm and loading/unloading area) occupied 0.25 acres. The site is located in a valley, with steep slopes to the west and east. A review of the Rockbridge, Ohio, 7.5 Minute Series, USGS Quadrangle Map indicates base levels of main drainage are approximately 750 feet above mean sea level (AMSL). Ridge top elevations in the area ranges from 900 feet AMSL to 1,100 feet AMSL. The site is approximately 780 feet AMSL, and is located in a valley that trends north.

2.2 Climate

Hocking County is characterized as a humid, continental climate with warm summers and cold winters. The monthly average (1951-1980) temperature ranges from 24°F in January to 71°F in July (Soil Survey Hocking County, Ohio, 1989).

The 1951-1980 annual normal precipitation for Hocking County is 38.5 inches. Precipitation is evenly distributed throughout the year with June (4.3 inches) being the wettest and February (2.2 inches) being the driest (Soil Survey Hocking County, Ohio, 1989).

2.3 Surface Water Hydrology

The Troxel Tank Farm is located within a stream valley. The area is fairly level with a downward slope to the west. A drainage ditch exists along the northern side of the gravel lane adjacent to the site. This drainage ditch does not receive any surface water run-off from the site; it receives surface water run-off from areas upgradient of the site. Surface run-off from the Troxel Tank Farm flows southward to a dry run which flows west to an unnamed stream. The dry run is located along the southern side of the site and is approximately four feet wide and three feet deep. Surface flow in the dry run is intermittent, with seasonal flow only occurring during periods of high precipitation. The unnamed tributary is also characterized as intermittent. This unnamed stream flows south-southwest to the Hocking River. The confluence of the unnamed tributary and Hocking River is approximately 3500 feet southwest of the site. The Hocking River is a major water way in the area. The general surface water flow direction of the Hocking River is to the southeast.

2.4 Geology and Soils

Geologically, the site is located within the Appalachian Plateau Physiographic Province of Ohio. The area is comprised on relatively horizontal sedimentary strata with subtle folds. Topography throughout the region is the result of fluvial (river and stream) processes that

have formed moderately steep slopes and relatively long, narrow valleys typical of highly dissected plateau regions.

The geology of the region is presented in Figure 2-1 (Site Geology Map). The area in which the Troxel Tank Farm is located consists of soils underlain by bedrock of the Waverly and Maxwell Groups, which consists of Mississippian age shales, sandstones and limestone, (Geologic Map of Ohio, 1992).

The soil type in the vicinity of the Troxel Tank Farm is in the Shelocta-Cruze-Wellston Association. This association is characterized as deep, gently sloping to very steep, well drained and moderately well drained soils formed in residuum and colluvium, derived from siltstone, shale, and sandstone, and in loess; on uplands. These soils are typically present on ridgetops and dissected hillsides. The ridgetops are narrow and have many high points and low saddles. The hill sides are commonly benched. Valleys are generally narrow. Slopes range from 2 to 70 percent. This association makes up about 35 percent of the county. (Soil Survey of Hocking County, Ohio, 1989).

2.5 Hydrogeology and Groundwater Quality

Groundwater in the area occurs in the natural porosity of both alluvial (unconsolidated) and bedrock (consolidated) formations. Dug wells in the alluvium located along the lower elevations are common and generally yield water in sufficient quantities for domestic use. Wells drilled into bedrock aquifers produce sufficient volumes of water for domestic purposes. A search of water well logs on file with the Ohio Department of Natural Resources indicated that the nearest groundwater well is located approximately 2,000 feet to the northwest. According to the well log, unconsolidated material (clay, sand, and gravel) was encountered to a depth of 81 feet bgs. Shale underlies the unconsolidated sediments to a depth of 230 feet. A ten-foot sand lense underlies the shale. The well was screened from 81 to 240' bgs. The log indicated the well produces 30 gallons of water per minute. The static water level was zero indicating the aquifer is under confined conditions.

An approximate groundwater flow direction is depicted on Figure 1-2 based on surface topography. The depicted groundwater flow direction is not based on the collection of field data, and thus may not represent actual conditions.

2.6 Ecological Zones

The operating portion of the site, while in operation, is estimated to be approximately 0.25 acres; based on this small area, the potential for an ecological zone that meets the definition stated in the CWP (Section 3.5, Ecological Zone Identification) is remote. Nevertheless, a level one ecological assessment (literature review) was performed at the site. The Rockbridge, Ohio quadrangle of the National Wetland Inventory map (USFWS, 1990) indicates many wetland areas to the west of the Troxel Tank Farm, most of which are either in the floodplain of the Hocking River, or are disconnected remnants of the river. The wetlands which could possibly intercept surface run-off from the area of the Troxel Tank Farm are as follows:

SOURCE: GEOLOGIC MAP OF OHIO:
STATE OF OHIO DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGICAL SURVEY, 1992

LITHOLOGY

Pc — CONEMAUGH GROUP –
Pennsylvanian Age shales, sandstone, coal and limestone.

Pp&a — POTTSVILLE AND ALLEGHENY GROUPS –
Pennsylvanian Age coal, sandstone, shales and limestones.

SITE LITHOLOGY → Mv&m — WAVERLY AND MAXVILLE GROUPS –
Mississippian Age shales, sandstones and limestone.

Dol&oh — OLENTANGY AND OHIO GROUPS –
Devonian Age shales.

N

GEOLOGIC MAP LOCATION

SCALE 1: 500,000

ONE INCH EQUALS APPROXIMATELY EIGHT MILES

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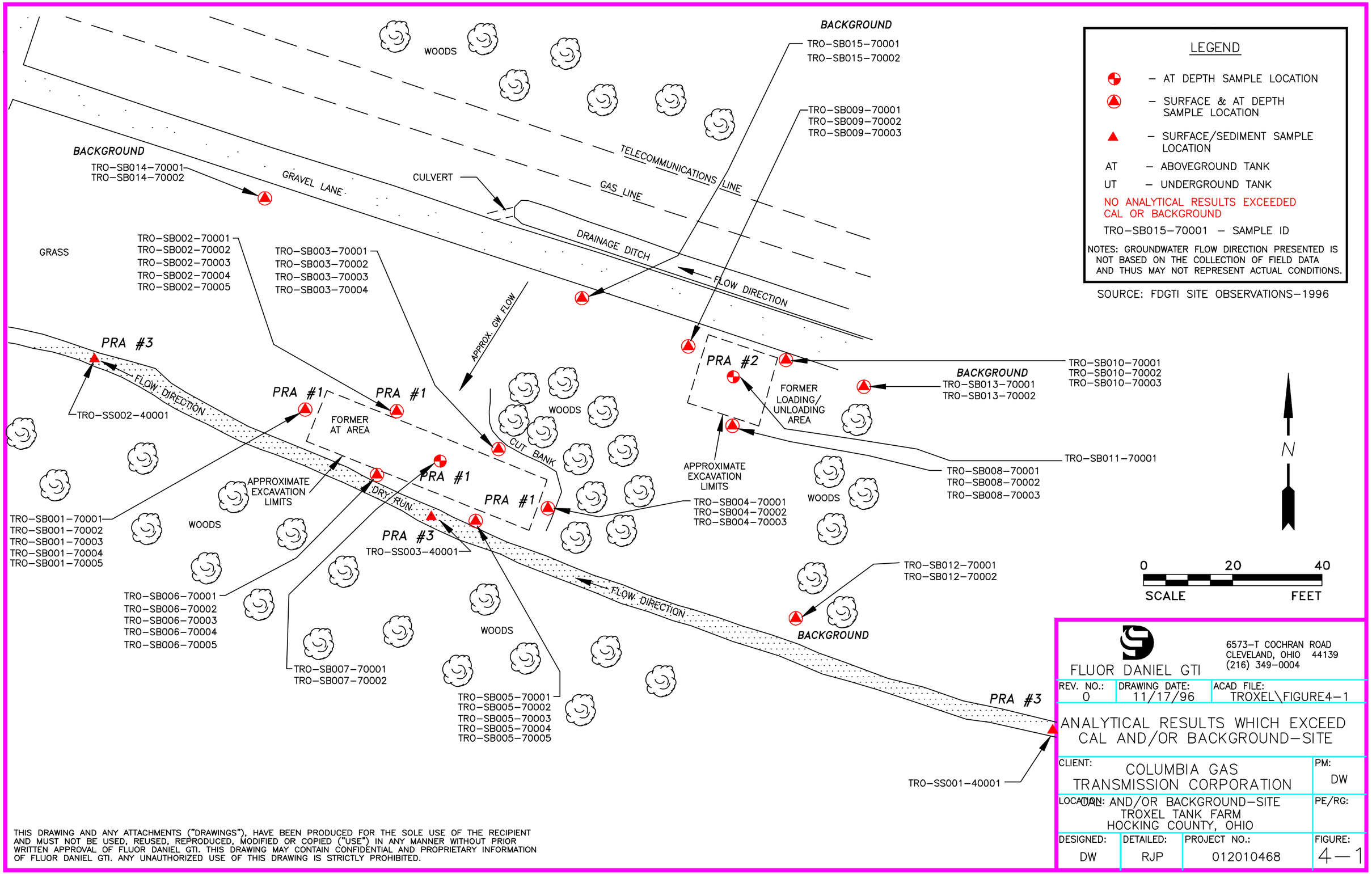
REV. NO.:	DRAWING DATE: 4/06/98	ACAD FILE: GEOLOGY

SITE GEOLOGY MAP

CLIENT: COLUMBIA GAS TRANSMISSION CORPORATION			PM: DAD
LOCATION: TROXEL TANK FARM HOCKING COUNTY, OHIO			PE/RG:
DESIGNED: ETF	DETAILED: RAM	PROJECT NO.:	FIGURE: 2-1



LEGEND

- – AT DEPTH SAMPLE LOCATION
- – SURFACE & AT DEPTH SAMPLE LOCATION
- – SURFACE/SEDIMENT SAMPLE LOCATION
- AT – ABOVEGROUND TANK
- UT – UNDERGROUND TANK
- NO ANALYTICAL RESULTS EXCEEDED CAL OR BACKGROUND
- TRO-SB015-70001 – SAMPLE ID

NOTES: GROUNDWATER FLOW DIRECTION PRESENTED IS NOT BASED ON THE COLLECTION OF FIELD DATA AND THUS MAY NOT REPRESENT ACTUAL CONDITIONS.

SOURCE: FDGTI SITE OBSERVATIONS–1996

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(216) 349-0004

REV. NO.:	DRAWING DATE:	ACAD FILE:
0	11/17/96	TROXEL\FIGURE4-1

ANALYTICAL RESULTS WHICH EXCEED CAL AND/OR BACKGROUND–SITE

CLIENT:	PM:
COLUMBIA GAS TRANSMISSION CORPORATION	DW
LOCATION: CAL AND/OR BACKGROUND–SITE TROXEL TANK FARM HOCKING COUNTY, OHIO	PE/RG:

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
DW	RJP	012010468	4–1

APPENDIX B
BORING LOGS

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 1/SB001
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
– 0 –				
	0.0	70001	ML	Yellowish Brown SILT and Fine Sand Trace Clay
– 2 –				
	4.0	70002	ML	Grayish Brown SILT and Fine Sand, Trace Clay
– 4 –				
	62.0	70003	CL	
– 6 –				
	0.0	70004	CL	
– 8 –				
	0.0	70005	CL	Grayish Brown Sandy CLAY
–10–				
–12–				
–14–				

Boring Log
Columbia Gas Transmission

Project: Traxel
Location: Hocking Co, OH

PRA/Location: 1/SB002
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
	0.0	70001	ML	Grayish Brown SILT and Sand, iron staining
-2-				
	0.8	70002	ML	Yellowish Brown SILT, Fine Sand, Trace clay
-4-				
	0.0	70003	ML	Yellowish Brown SILT, Fine Sand, Trace Clay
-6-				
	0.0	70004	ML	Brown SILT and Fine Sand, Trace Clay
-8-				
	0.4	70005	CL	Gray and Brown CLAY, Some Silt and Sand
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 1/SB003
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
0				
	0.0	70001	SM	
2				
	1.0	70002	SM	Brown SAND and Silt
4				
	0.0	70003	SM	Brown SAND Some Silt
6				
	0.0	70004	SM	
			SM	Brown SAND, Some Silt, At 7.5' Refusal / Weathered Sandstone
8				
10				
12				
14				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co., OH

PRA/Location: 1/SB004
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
	0.0	70001	SM	
-2-				
	0.0	70002	SM	Light Brown SAND, Some Silt
-4-				
	0.4	70003	SM	
			SM	Brown SAND, Some Silt, Weathered Sandstone at 5.0' Refusal at 5.5'
-6-				
-8-				
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking CO, OH

PRA/Location: 1/SB005
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
0				
		70001	ML	Grayish Brown SILT and Sand
2				
		70002	ML	Brown SILT and Sand
4				
		70003	ML	Brown SILT and Sand, Trace Gravel, iron Staining
6				
		70004	SM	Brown SAND, Some Silt and Weathered Sandstone
8				
		70005	SM	Brown SAND, Some Silt, Weathered Sandstone
10				
12				
14				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 1/SB006
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
	0.0	70001	CL	
-2-				
	0.0	70002	CL	
-4-				
	0.0	70003	CL	Grayish Brown Sandy CLAY
-6-				
	0.0	70004	ML	Grayish Brown Sandy SILT, Iron Staining
-8-				
	0.0	70005	SM	Grayish Brown SAND, Some Silt
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 1/SB007
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
-2-			SP.	Brownish Gray SAND and Gravel, Fill
-4-		70001	SM	
-6-			SM	Olive Gray Silty SAND
-8-		70002	CL	Gray and Brown Sandy CLAY
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Traxel
Location: Hocking Co, OH

PRA/Location: 2 / SB008
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
– 0 –				
		70001	SM	Brown SAND and Silt
– 2 –				
		70002	SM	Yellowish Brown to Orange Brown SAND, Some Silt
– 4 –				
		70003	SM	Orangish Brown SAND with Sandstone Fragments
– 6 –				
– 8 –				
–10–				
–12–				
–14–				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 2/SB009
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
		70001	SM	Grayish Brown Fine SAND, Some Silt
-2-				
		70002	SP	Orange SAND
-4-				
		70003	SP	Orange SAND, Sandstone Fragments, Refusal at 5.0'
-6-				
-8-				
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 2/SB010
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
		70001	SM	Grayish Brown SAND and Silt
-2-				
		70002	SM	Orange SAND and Silt
-4-				
		70003	SP	Orange SAND
-6-				
-8-				
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 2/SB011
Log By: (b) (4)
11/05/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
– 0 –				
– 2 –				
– 4 –				
	15.0	70001	ML	Grayish Brown SILT and Sand
				Refusal at 5.0'
– 6 –				
– 8 –				
–10–				
–12–				
–14–				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: 3/SS001
Log By: (b) (4)
11/04/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
		40001	SM	Brown Silty Fine SAND
-2-				
-4-				
-6-				
-8-				
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Traxel
Location: Hocking Co, OH

PRA/Location: 3/55002
Log By: (b) (4)
11/04/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
– 0 –				
— —		40001	SM	Brown Silty Fine SAND
– 2 –				
— —				
– 4 –				
— —				
– 6 –				
— —				
– 8 –				
— —				
–10–				
— —				
–12–				
— —				
–14–				
— —				

Boring Log
Columbia Gas Transmission

Project: Troxel

Location: Hocking Co, OH

PRA/Location: 3/SS003

Log By: (b) (4)

11/04/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
– 0 –				
		40001	SM	Brown Silty Fine SAND
– 2 –				
– 4 –				
– 6 –				
– 8 –				
–10–				
–12–				
–14–				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: Background/SB013
Log By: (b) (4)
11/04/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
– 0 –				
		70001	ML	
– 2 –				Moderately Brown to Grayish Brown, SILT and Fine
		70002	ML	Sand, Mottled, Some Iron Staining, Moist
– 4 –				
– 6 –				
– 8 –				
–10–				
–12–				
–14–				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: Background/SB012
Log By: (b) (4)
11/24/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-				
		70001	ML	
-2-				Moderately Brown SILT and Fine sand, Some
		70002	ML	Gravel and Iron Staining, moist
-4-				
-6-				
-8-				
-10-				
-12-				
-14-				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: Background/SB015
Log By: (b) (4)
11/04/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
– 0 –				
		70001	ML	
– 2 –				
		70002	ML	Moderately Brown to Dark Yellowish Orange SILT and Fine Sand, Moist
– 4 –				
– 6 –				
– 8 –				
–10–				
–12–				
–14–				

Boring Log
Columbia Gas Transmission

Project: Troxel
Location: Hocking Co, OH

PRA/Location: Background/SB014
Log By: (b) (4)
11/04/97

Depth (FT.)	PID (PPM)	Sample ID	USCS Class.	Description (Color, Texture, Structure) Trace <10%. Little 10% to 20%. Some 20% to 35%. And 35% to 50%
-0-			GP	0.4' of GRAVEL
		70001	ML	
-2-				
		70002	ML	Moderately Brown to Yellowish Brown SILT + Fine Sand, Moist Some Gravel
-4-				
-6-				
-8-				
-10-				
-12-				
-14-				

Comprehensive Analytical Results

		PRA	0			
		PRA Description	WASTE CHARACTERIZATION			
		Sample Type	Normal Sample			
		Sample Id	TRO-DS001-20001		TRO-DS002-70001	
		Depth - ft bgs	0 - 0		0 - 0	
		Result Units	UG/L		UG/L	
Category	Analyte	Action Level	Result Flag	Det Lim	Result Flag	Det Lim
P/PCB	AROCLOR-1016	.5	0.065 U	0.065		
	AROCLOR-1221	.5	0.065 U	0.065		
	AROCLOR-1232	.5	0.065 U	0.065		
	AROCLOR-1242	.5	0.065 U	0.065		
	AROCLOR-1248	.5	0.065 U	0.065		
	AROCLOR-1254	.5	0.065 U	0.065		
	AROCLOR-1260	.5	0.065 U	0.065		
METAL	BARIUM, TOTAL	2000	460	200		
	CADMIUM, TOTAL	5	5.0 U	5.0		
	CHROMIUM, TOTAL	100	210	10.0		
	LEAD, TOTAL	15	83.0	5.0		
	SILVER, TOTAL	100	10.0 U	10.0		
	LEAD, TCLP	400			500 U	500
	SILVER, TCLP LEACHATE	390			500 U	500
	BARIUM, TCLP LEACHATE	5500			10000 U	10000
	CADMIUM, TCLP LEACHATE	39			1000 U	1000
	CHROMIUM, TCLP LEACHATE	230			500 U	500
	SELENIUM, TCLP LEACHATE				100 U	100
	MERCURY, TCLP LEACHATE	23			20.0 UJ	20.0

Note:

Blank cells in result column indicate an analysis was not performed for that analyte.

Comprehensive Analytical Results

		PRA	0			
		PRA Description	WASTE CHARACTERIZATION			
		Sample Type	Normal Sample			
		Sample Id	TRO-DS001-20001		TRO-DS002-70001	
		Depth - ft bgs	0 - 0		0 - 0	
		Result Units	UG/L		UG/L	
Category	Analyte	Action Level	Result Flag	Det Lim	Result Flag	Det Lim
	ARSENIC, SPLP	.43			500 U	500
	BARIUM, SPLP	5500			10000 U	10000
	CADMIUM, SPLP	39			1000 U	1000
	CHROMIUM, SPLP	230			500 U	500
	LEAD, SPLP	400			500 U	500
	MERCURY, SPLP	23			20.0 UJ	20.0
	SELENIUM, SPLP				100 U	100
	SILVER, SPLP	390			500 U	500
	MERCURY, TOTAL	2	1.0 U	1.0		
	ARSENIC, TOTAL	50	140	10.0		
	ARSENIC, TCLP LEACHATE	.43			500 U	500

Note:

Blank cells in result column indicate an analysis was not performed for that analyte.